DRAFT GUIDELINES (VERSION 3)

PLAN APPROACH FOR REDUCING TOXIC AIR CONTAMINANTS (TACS) AND FINE PARTICULATE MATTER (PM2.5)

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REVISED FROM A PRELIMINARY DRAFT PREPARED BY: ICF INTERNATIONAL

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Acronyms and Abbreviations

ARB	California Air Resources Board
BAAQMD, District	Bay Area Air Quality Management District
BACT	Best Available Control Technology
CAPCOA	California Air Pollution Control Officers Association
CARE	Community Air Risk Evaluation
CEQA	California Environmental Quality Act
CNG	compressed natural gas
DPM	diesel particulate matter
EPA	Environmental Protection Agency
GGRS	Greenhouse Gas Reduction Strategy
GDF	gasoline dispensing facility
HEPA	high efficiency particulate air
MOU	memorandum of understanding
OEHHA	Office of Environmental Health Hazard Assessment
PERC	perchloroethylene
PM2.5	particulate matter less than 2.5 microns in diameter
TACs	toxic air contaminants
TBACT	Best Available Control Technology for Toxics
TRUs	transportation refrigeration units

Draft Guidelines (Version 3) Plan Approach for Reducing Toxic Air Contaminants (TACs) and Fine Particulate Matter (PM2.5)

This is the third version of a public review draft intended to outline the general parameters of a plan based approach for a more holistic evaluation of community health risks relative to toxic air contaminants and fine particulate matter that can promote better community health outcomes than a project-by project approach. **Like the earlier drafts, this document does not represent any final decisions of the Bay Area Air Quality Management District (District, BAAQMD) and is intended to stimulate public input and discussion for the District's consideration in further developing guidance for the preparation of such plans.**

1. Introduction

a. Overview

For decades, environmental regulators—the U.S. Environmental Protection Agency (EPA) at the federal level, the California Air Resources Board (ARB) at the state level, and the Bay Area Air Quality Management District (BAAQMD) at the local level—have been actively engaged in regulating sources of air pollution in the Bay Area to improve air quality. Reducing pollution sources and working to achieve regional air quality standards have been, and continue to be, vital to maintaining and improving air quality and reducing exposures to harmful airborne pollutants. Working together, federal, state, and local regulators have produced great improvements in the Bay Area's air quality. However, another key element of controlling exposures to air pollutants is urban design and land use planning.

Urban design influences exposures to air pollutants in two important ways. First, infill development and high urban densities can promote the use of public transportation and reduce commute lengths, directly reducing pollutant emissions from motor vehicles, the greatest single source of air pollution. Second, thoughtful urban design separates residences and other sensitive land uses from industrial pollution sources and from busy freeways and roadways.

Furthermore, because urban design and planning that is coordinated and consistent is often more effective than a project-by-project approach, the BAAQMD—with input and suggestions from the Community Air Risk Evaluation (CARE) Task Force, local cities, and local health departments—has begun to develop elements and requirements for a plan based approach to address community risk and hazards, the purpose and application of which is described herein.

Cities or counties within the Bay Area Air seeking a proactive approach for reducing exposure to toxic air contaminants (TACs) and particulate matter less than 2.5 microns in diameter (PM2.5) should use this document as an introduction to preparing a plan. Jurisdictions within areas identified by the BAAQMD's CARE program as being significantly affected by local sources of TAC and PM2.5 may be particularly interested in a plan development; although, any jurisdiction in the BAAQMD may develop and use such a plan. The BAAQMD can help cities and counties in producing plans and reviewing them prior to their approval or adoption by the local governments

b. Purpose of This Document

It is the intent of the BAAQMD that a plan based approach to reducing risk and hazards be developed and approved by cities or counties with substantial support, guidance, and review from the BAAQMD and with a public participation and an environmental review process. This document provides the following guidance for a plan based approach to reducing risk and hazards:

- Sets forth recommendations and a general framework for a plan;
- Defines appropriate data sources and risk models on which to base a plan;
- Provides guidance to preparers on how to address boundaries, target setting, public involvement, and updates to a plan; and
- Explains the relationship of a plan to the CEQA process, specifically how the CEQA process for certain projects can potentially be streamlined by demonstrating consistency with a plan.

2. Plan Approach Framework

a. Plan Goals

A plan based approach to reducing risk and hazards is a multi-year plan with two main goals. First, such a plan provides a planning tool to ensure that air quality and public health improve through the reduction of TACs and PM2.5 concentrations and exposures. Second, it provides a mechanism for streamlining environmental compliance under CEQA. Because project planning that is coordinated and consistent is often more effective and efficient than a project-by-project approach, the development of a plan will likely be a more effective and efficient way to improve air quality than less coordinated approaches.

A plan based approach to reducing risk and hazards will be designed to improve public health related to exposure to TACs and PM2.5 over time. It must include reduction targets identified by the local government preparing the plan and reviewed by the entire community covered by the plan. A plan will establish a target date by which the community seeks to meet the goal. A plan based approach is similar in concept to a climate action plan which also sets a reduction target, a target year, and a trajectory for the community to reach the target.

The plan based approach accounts for the complexity of the sources in a community, adopts measures for the reduction of risks over time, and specifies the likely time required to achieve real improvements.

A plan based approach would assess existing and projected health risks associated with TACs and PM2.5 for the community as a whole. As such, projects that are fully consistent with the plan in terms of incorporation of all the required measures, can be candidates for streamlining during development review and CEQA as they relate to TACs and PM2.5 risks.

b. Elements of a Plan Based Approach to Reducing Risk and Hazards

A plan should,

- Include a robust public participation process to facilitate community input from the affected community to help develop goals and strategies.
- Define a planning area (see discussion in Section 4).
- Identify sensitive receptor areas within the planning area. These areas (also discussed in Section 4) include
  - residential blocks or neighborhoods;
  - schools and school yards, parks and play grounds, daycare centers, nursing homes, and medical facilities; and
  - priority development areas, including future development projects of the above.
- Develop base- and target-year emissions inventories of TACs and PM2.5.
- Include risk modeling of current and future risks for each identified sensitive receptor area. This modeling should be consistent with the project modeling outlined in the CEQA Air Quality Guidelines and detailed in a Modeling Guidance document (BAAQMD 2010b). Individual and cumulative risks for each sensitive receptor area should be evaluated for the identified sources.
- Establish risk and exposure reduction goals for the community by the selected target date(s).
- Where necessary, identify additional reduction targets to meet target thresholds.
- Where necessary, identify feasible, quantifiable, and verifiable measures to reduce emissions and exposures for each sensitive receptor area.
- Include procedures for monitoring and updating the inventory, modeling, and reduction measures.

c. Advantages of a Plan Based Approach to Reducing Risk and Hazards

The intent of the plan is to provide a holistic risk reduction plan that promotes more effective and efficient risk reductions compared with a project-by-project approach. The advantages of the plan approach are that it can

- Present a consistent treatment of risks for subsequent development;
- Reduce the processing burden of individual projects under CEQA by allowing projects to streamline their CEQA review;
- Allow the advantages and disadvantages of individual projects to be judged in the context of the collective planning area's progress toward the goals set forth in a plan—in effect providing more flexibility;
- Account for expected benefits of emission reductions from regulatory action on the plan area; and
- Provide a framework for identifying and reducing other public health risks a community may experience, such as noise and indoor air pollutants.

By planning in advance, health risk information can be available to the public, city planning staff, and city decision-makers to inform land use choices well in advance of project proposals being advanced through the entitlement process. The community can identify feasible measures that can be applied consistently across all new projects as necessary to control and/or reduce risks. The community can also identify the areas where action may be inadequate to reach target risk levels, and consider up front whether current land use planning is appropriately balancing public health protection with economic development.

One important goal of this approach is to promote the reduction of community health risks. Another is to streamline the CEQA process for projects wherein risks can be managed within the risk and hazards thresholds. By incentivizing development with relatively lower health risks and discouraging development with higher health risks, a plan approach will send the right signals to both private and public project proponents early in the project cycle and express the importance of risk reduction as a priority.

d. Where a Plan May Be Useful

Listed here are communities that would likely benefit from a plan based approach to reducing risk and hazards. This list is not meant to be comprehensive; other communities may also benefit from a plan based approach.

- A community that desires to better understand existing health risks within the community in order to prioritize actions to improve air quality.
- A community that is planning for future infill development that would potentially introduce receptors to significant risks and hazards from nearby pollution sources. Such a community may wish to examine how to promote infill development without

increasing public health risks. Such a community may also wish to examine the potential impact of state regulations and local action to control health risks in the short and long run.

- A community that is considering future land use plans to expand roadways and other TAC and PM2.5 sources (such as warehousing) and desires to inform land use planning to avoid cumulatively significant risks through site selection and site controls.

e. Where a Plan May Not Be Useful

Although the establishment of a plan based approach is possible for any area, certain areas (such as those listed here) are not expected to benefit from such a planning effort.

- Remote areas with existing health risks less with no future planning to introduce new receptors within proximity to significant risks or to introduce new TAC sources within proximity to sensitive receptors.
- Residential areas located substantially far from any substantial TAC or PM2.5 sources, including major roadways.
- Industrial or commercial areas that contain no existing or planned sensitive receptors nearby of any sensitive receptor.

f. Plan versus Project-by-Project Analysis

A plan based approach to reducing risk and hazards is intended to be a comprehensive plan that would be accepted in lieu of an individual project analysis of local risks and hazards. As such, a plan must provide the same type of analysis, to provide "pre-screening" of local risks and hazards for planned development areas. Targets developed as part of a plan should be based on the best available data and standard dispersion models. The goal of a plan is for risk and ambient concentration levels within the plan area to decrease below the individual and cumulative thresholds identified by the local government by a target date. However, the reduction targets and interim milestones set in a plan could be expressed with a variety of metrics, depending on the specific areas of concern for a community.

A plan based approach seeks to inform local planning by making a comprehensive evaluation of TACs within a community, identifying the risks to that community, identifying the benefits of state vehicle and fuel regulations over time, and identifying feasible local measures that can contribute to lowering the risk in the community beyond that which would be achieved solely through state action. As such, a plan seeks to promote air quality that is health protective within the community.

Because air quality conditions in affected communities result in part from land use and transportation decisions made over many years, comprehensive, community-wide strategies will achieve the greatest reductions in emissions of and exposure to TACs and PM2.5. BAAQMD is committed to completing TAC/PM2.5 emissions inventory work and

the generalized risk assessment for planning areas. This work will assist local communities to understand their existing health risks better and to support those communities that desire to complete a plan.

The BAAQMD's mission is to promote public health and welfare by seeking to reduce exposure to criteria and toxic air contaminants. A plan based approach to reducing risk and hazards is one tool a community could use to seek better public health outcomes than those resulting from the current project-by-project approach. The BAAQMD believes that advance consideration of current and future health risks and identification of feasible means of controlling and/or reducing those risks will result in improved health outcomes for Bay Area residents.

The BAAQMD is committed to supporting communities that decide to pursue a plan by providing the technical data necessary to complete the emissions inventory and risk assessment required for the effort. The BAAQMD is also available to provide technical advice to communities preparing a plan.

The BAAQMD supports local land use planning that promotes infill, mixed-use, walking, cycling, and transit-oriented development. However, the BAAQMD believes that compact or infill development should be designed to avoid significant air quality risks to existing or future residents. The BAAQMD supports planning efforts such as the plan approach because these efforts allow a community to examine the current and future public health consequences of land use decisions throughout the planning process, not just at the time of permit approval.

g. Relation to State and Federal Regulations

For many communities, the primary source of risk from TACs and an important source of PM2.5 is diesel truck traffic on highways and large arterial roadways. The ARB has adopted aggressive regulations related to DPM. The ARB's comprehensive strategy, known as the Diesel Risk Reduction Plan, includes regulatory standards for all new on-road, off-road, and stationary diesel-fueled engines and is anticipated to reduce diesel PM emissions and the associated health risk by about 75 percent in 2010 and 85 percent in 2020 (ARB 2000). The emissions forecast should account for the impact of these regulations on the plan area and for reasonably foreseeable projects within the plan area.

A plan and the emissions estimates used to support it should be developed to be consistent with state and federal regulations. While state action concerning vehicle and fuels will contribute substantially to the reduction of health risks from DPM and other TACs, the plan may identify areas that need additional reductions. Through a plan, local governments and the District can develop feasible local measures to can reduce risks either sooner or beyond that which can be achieved via the state actions in pursuit of local health risk goals.

Further, a plan can give critical guidance to local land use planners about what can realistically be achieved over time. Given that land use decisions are made locally, only the local government can affect land use policies that address airborne health risks—risks

that cannot be brought down to acceptable levels solely through state action. Local land use policies can potentially result in avoiding the introduction of new receptors near existing sources or new sources near existing sensitive receptors.

A fundamental purpose of the plan based approach is, in combination with the state Diesel Risk Reduction Strategy, to reduce current health risk levels and to avoid exposure of new receptors to significant health risks. Targets developed as part of a plan should be based on the best available data and standard dispersion models. A plan seeks to inform local planning by making a comprehensive evaluation of TAC/PM2.5 within a targeted community, identifying the risks to that community, identifying the benefits of state vehicle and fuel regulations over time, and identifying feasible local measures that can contribute to lowering the risk in the community beyond that which would be achieved solely through state action.

h. Plan Relation to the CARE Program

A plan based approach is designed to be especially effective in areas that already are severely affected by TACs and PM2.5, such as impacted communities identified through the CARE program. The BAAQMD initiated the CARE program in 2004 to evaluate and reduce health risks associated with exposures to outdoor TACs/PM2.5 from point sources, area sources, and mobile sources. Through the CARE program, the BAAQMD has identified TAC/PM2.5 sources and areas severely affected by TACs, primarily diesel particulate matter (DPM). Additionally, the CARE program develops and implements a variety of mitigation measures with a special focus on these most severely affected communities. The BAAQMD encourages CARE communities to develop a plan based approach to reducing risk and hazards. Non-CARE communities are encouraged to prepare plans where substantial areas may have high levels of risk and hazards.

The CARE program Task Force—with staff appointed members representing governmental agencies, including city and region planners; businesses; health professionals; and community groups—helps to advise the BAAQMD in developing plan guidelines. The Task Force also provides feedback to the BAAQMD in the development and review of individual plans.

3. Plan Development and Approval

a. City/County Role

- **Cities and counties take a lead on developing plans to reduce risk and hazards**
- **Such plans are approved by cities or counties.**

This approach is consistent with the fact that cities and counties have land use authority that the plans must address.

b. Air District Role

The BAAQMD will provide strong support to jurisdictions preparing plans, including

- Technical support. The BAAQMD has committed to providing air emissions, dispersion modeling, and relevant risk assessments. Cities and counties are not expected to develop these technical inputs, but can do so if resources allow. If local governments decide to develop these inputs independently, they and BAAQMD should coordinate closely to ensure general compatibility of methods.
- Financial support. A small amount of funding has been dedicated to help cities prepare plans, with priority given to areas that have been identified as being impacted areas through the CARE program. The BAAQMD is investigating and applying for State and federal grant programs as potential additional funding sources.
- Review and comments. The BAAQMD can review and comment on all plans as requested by local governments.

c. Public Outreach

The development of a plan should have a robust public participation process to facilitate input from the entire identified community on the plans' goals and strategies. The nature and amount of public involvement is at the discretion of the jurisdiction preparing a plan.

The BAAQMD recommends for the lead jurisdiction to prepare a public involvement plan and a multi-stakeholder review process as part of the plan development. A public involvement plan may include steps to identify stakeholders, facilitate opportunities for input, and offer a public review process. Likely stakeholders in the plan development process include the following: community members; local environmental advocacy groups; public health officials; business organizations; local businesses interests; local agency staff from special districts—schools, parks, and transportation districts—and representatives from identified significant stationary sources. To provide meaningful and effective public outreach, the lead jurisdiction should be familiar with unique conditions in the plan community such as, language translation barriers, existing public health concerns, and information accessibility options (such as, internet connections, and library access.

The public involvement plan should identify opportunities for public input and review, such as: hosting public meetings and workshops, providing website tools, and presenting at existing standing meetings. A lead jurisdiction may also consider establishing a multi-stakeholder working group to ensure a high level of public participation throughout the plan development process. The BAAQMD can present technical information as requested.

d. Environmental Review

One motivation for cities and counties to produce a plan is that it may allow CEQA streamlining. The BAAQMD believes that this is appropriate since it may reward a more

effective and efficient planning process and, at the same time, send the right signals to project proponents to ensure that these projects are consistent with the community's air quality improvement priorities. A plan would not provide regulatory relief for projects that are inconsistent with community efforts to improve air quality.

It seems likely that CEQA compliance will be necessary for a plan's adoption in order to allow for future streamlining of analysis of TAC/PM2.5 health risks for project fully consistent with a plan.

4. Defining the Planning Area, Sensitive Receptor Areas, and Area of Influence

a. The Planning Area

The planning area is defined as the physical area within which the local government preparing the plan is interested in evaluating long-term health risks and allowing for a programmatic evaluation. The planning area may correspond to a city's boundaries.. The planning area could also be sub-areas within a city, a county, or sub-areas of a county. It may also be that two or more cities wish to jointly develop a plan, in which case, the planning area could span jurisdictional boundaries.

b. Sensitive Receptor Areas

Sensitive receptors are defined by BAAQMD's *CEQA Air Quality Guidelines* as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples include schools, hospitals, and residential areas. Table 1 lists locations designated in the California Air Pollution Control Officers Association's (CAPCOA's) *Health Risk Assessment for Land Use Projects* guidance (CAPCOA 2009) where sensitive receptors are typically found. Table 1 serves as a recommendation for receptors to be considered in a plan.

Within the planning area, *sensitive receptor areas* are defined as areas that include residential neighborhoods, schools and school yards, parks and play grounds, daycare centers, nursing homes and medical facilities, and priority development areas, including future development projects of the above. The sensitive receptor areas will form the basic units for which local risks and hazards are assessed. The actual areas selected may correspond to city parcels, city blocks, census tracts, block groups[1], specific plan areas, or neighborhoods.

[1] As defined by the U.S. Census 2000 or later.

Table 1. Typical locations where sensitive receptors may be located

Sensitive Receptors
• Residential Communities • Schools • Schoolyards • Parks • Playgrounds • Daycare Centers • Nursing Homes • Hospitals
Source: CAPCOA 2009: *Health Risk Assessments for Land Use Projects—CAPCOA Guidance Document.* July 2009.

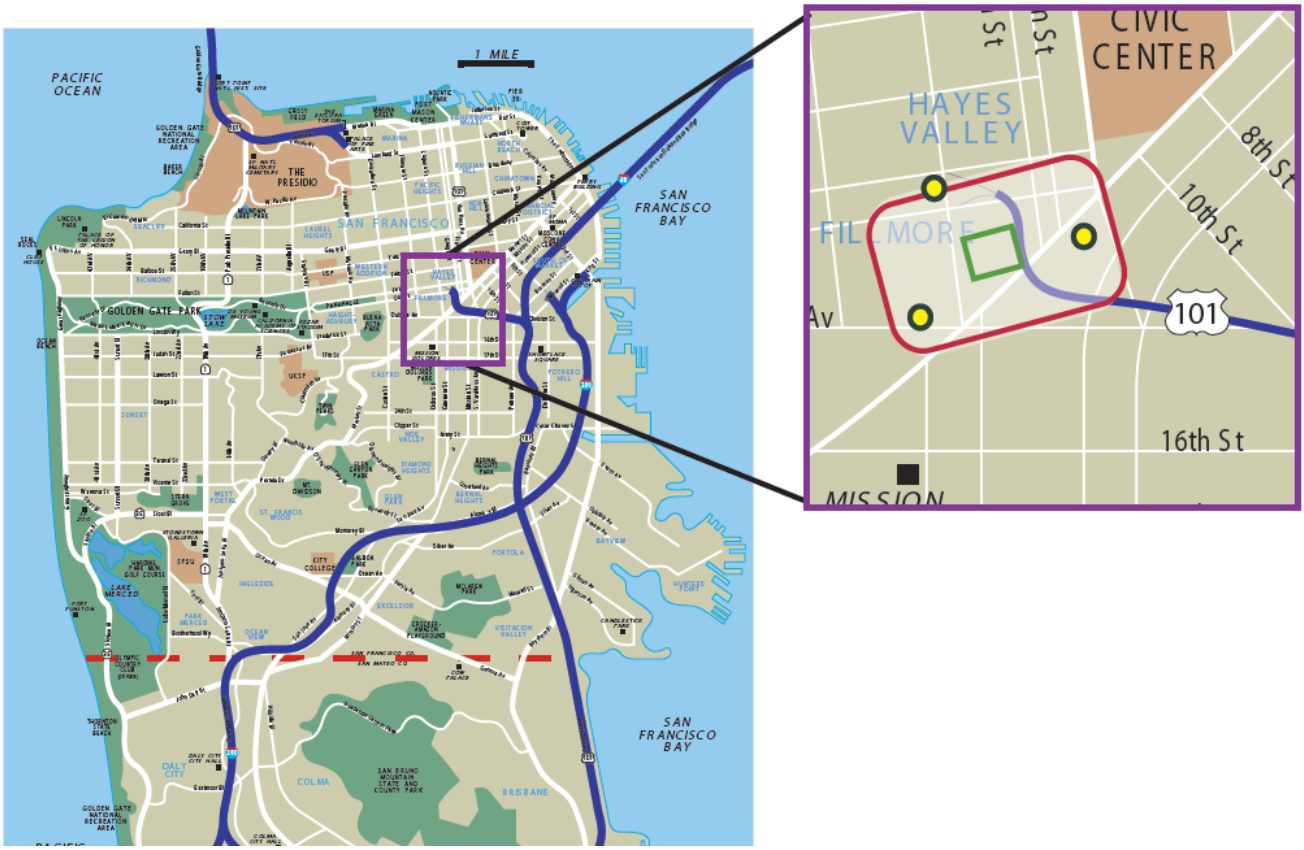

Figure 1. A hypothetical example of plan area, sensitive receptor area, and area of influence. The plan area may correspond to a city's boundaries (in this example the City and County of San Francisco; left image, red dashed line and coastline); the sensitive receptor area may correspond to a city parcel (right inset, green rectangle); the area of influence (right inset, red rectangle) is around the sensitive receptor area. Stationary sources (right, small yellow circles) and roadways are shown in and adjacent

to the area of influence. Many such sensitive receptor areas should be considered in developing a plan for a large city.

c. The Area of Influence

The area of influence is defined as the area containing TAC or PM2.5 sources that should be evaluated in relation to each sensitive receptor area. Discretion is given to a local government in determining the most appropriate boundary. See Figure 1 for an example of the interrelation between the planning area, sensitive receptor area, and area of influence, and sources to consider for a plan analysis.

Line sources (e.g. roadways and railroad tracks) will likely not be wholly contained within either the sensitive receptor area or the area of influence. When calculating risk within the planning area with dispersion models it is recommended that a line source be modeled within the area of influence and a significant distance upstream and downstream of the area of influence to ensure that the health risk from the line source is not under-represented. The details of evaluating risks from such sources are discussed in the BAAQMD's *Modeling Guidance* (BAAQMD 2010b).

d. Selecting the Planning Area

Certain disadvantages may be associated with a planning area that is either too large or too small. The magnitude of health benefits gained from a small planning area may be limited, while a large planning area may become logistically difficult to manage. Latitude is given to a local government to define the planning area by several means in addition to geography and jurisdiction. For example, a community may opt to focus a plan on a single community of concern. Alternatively, a community could define a plan geographically around a single dominating source (e.g. a port or rail yard). However, as described below, once a planning sensitive receptor area is defined, all sources within the area of influence must be included in order to comprehensively evaluate TAC and PM2.5 risk. The BAAQMD recommends that local governments include existing neighborhoods, as well as priority development areas, in the planning area.

e. Selecting Sensitive Receptor Areas

Selecting the sensitive receptor areas as the basis for risk and hazards analyses implies that the analyses will be receptor oriented. A receptor-oriented analysis identifies a group of receptors (sensitive populations) or an area with receptors and examines risks to these receptors from a multiple sources. This is in contrast to a more typical a source-oriented approach which focuses on a source or group of sources and examines its effect on multiple receptors. A heath risk assessment of a new source (for example during a permitting process) is an example of a source-oriented risk analysis. See Figure 2 for schematic illustrations of receptor-oriented versus source-oriented approaches. The advantage of examining risks using a receptor-oriented is that impacts of multiple sources can be examined, facilitating more of a cumulative analysis of risk.

Setting boundaries of the sensitive receptor areas is at the discretion of the local government preparing a plan. Each community will have unique characteristics and specific TAC and PM2.5 concerns. To maximize effectiveness of a plan, the BAAQMD can help identify key issues and define appropriate boundaries.

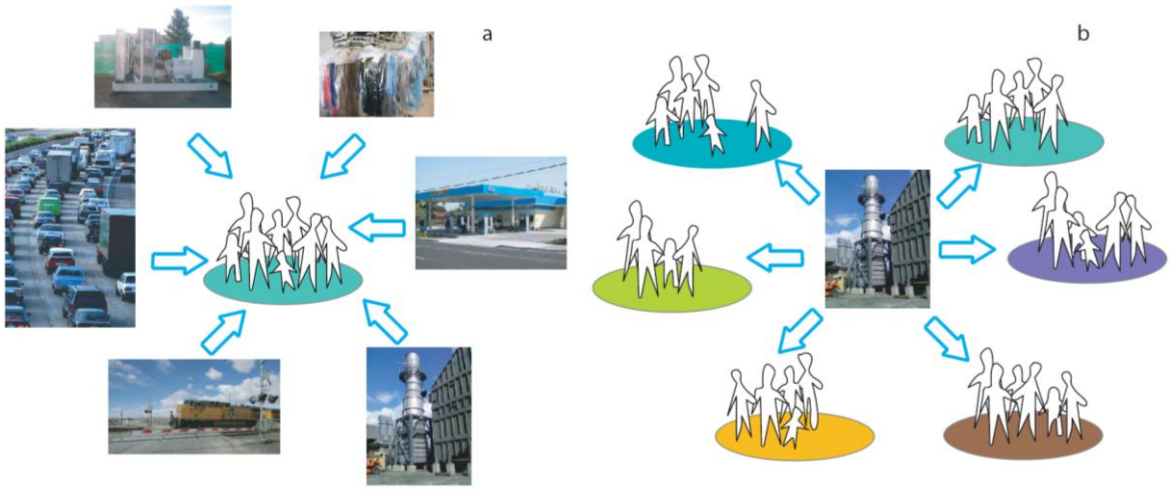

Figure 2. A schematic illustration of a receptor-oriented (a) versus a source-oriented (b) approach.

f. Coordination among Communities

The BAAQMD encourages communities within a jurisdiction or across jurisdictional boundaries, if similar exposure concerns exist, to develop a joint plan or a plan that is complementary and highly cooperative. Secondly, neighboring communities that develop two unique plans may choose to enter into a memorandum of understanding (MOU) for projects along the border of both areas. The BAAQMD can help identify opportunities for cooperation and to structure cooperative plans.

5. Estimating TACs and PM2.5 Emissions within the Planning Area

a. Estimating Emissions: Base Years and Target Years

The BAAQMD can prepare the TAC and PM2.5 emissions inventory needed to develop a plan; or the BAAQMD will advise and assist a local government that chooses to prepare such an emissions inventory. A plan emissions inventory identifies all major TAC and PM2.5 sources, and their emission rates, affecting the sensitive receptor areas within the plan area. The inventory identifies emissions sources in the plan area and estimates the magnitudes of the sources for TAC and PM2.5 pollutants. For example, the inventory

might include emissions from state highways, local mobile sources and large point and area sources such as refineries, power plants, gas stations, or rail yards. The inventory is reported in units of mass/day.

The emissions base year is the starting point for examining TACs and PM2.5 effects on receptors. The base year should be selected to be representative of recent, or near-term, "typical" conditions.

The emissions target year is an estimate of what the inventory of all major emissions sources will be in a future year, when plans are scheduled to achieve the goals and reduction target established. The emissions target year inventory identifies emissions sources that will affect the plan area in the future estimates the magnitudes of the sources in the future year. Emissions in the target year include the same source categories as the base year inventory and must use the same plan area boundary as the base year inventory.

Most elements of the ARB's Diesel Risk Reduction Plan (ARB 2000) will be implemented or underway by 2020. Some longer-term planning changes may extend beyond 2020 to achieve their full benefits, such as the effects of land-use rezoning; but many significant changes will be in effect by that date.

Table 2 presents a tentative list of TACs that may be considered in a plan's analysis along with each TAC's cancer and non-cancer risk factors based on Office of Environmental Health Hazard Assessment (OEHHA) guidance.

b. Data Sources for Estimating Emissions

To support upcoming CEQA evaluations and the development of plans, the BAAQMD is developing a detailed, local-scale inventory for base and target years of TAC and PM2.5 emissions within the region. The BAAQMD inventory may be used for both the base and target years. Using the methods or the actual emissions estimates developed by the BAAQMD will promote consistency among plans. The BAAQMD can work with the preparer to provide emissions estimates relevant to the plan's area of influence. In addition, the BAAQMD is reviewing and improving modeling parameters for many significant emissions sources; these parameters are critical inputs for air dispersion modeling.

c. Elements of the Emissions Inventory

The BAAQMD, working with a consultant, has developed a work plan for generating the detailed emissions inventories needed for plans. The emission inventory work calls for reviewing and improving emissions estimates and modeling parameters in the following areas:

- On-road mobile source emissions in the Bay Area and in communities identified as impacted through the CARE program. The work plan calls for developing emission estimates for cars and trucks on major roadways and highways in the Bay Area using the most recent traffic count data available from Caltrans and other sources. Within

communities identified as impacted through the CARE program, emissions estimates will also be generated for selected non-state roadways.

- Emissions from stationary diesel engines. The work plan calls for ranking diesel generators by risk-weighted TAC emissions and PM2.5 emissions. For generators ranked among the top 1,000 in the Bay Area, particular attention will be given to review operations, emissions, and stack parameters required for dispersion modeling purposes.
- Emissions from gasoline dispensing facilities (GDFs) in the Bay Area. For GDFs ranked among the top 1,000 in the Bay Area, pump dispenser dimensions, number of pumps, and vent stack parameters will be reviewed using information from permits and site visits.
- Emissions from dry cleaners that use perchloroethylene (PERC) in the Bay Area. ARB and BAAQMD dry cleaning regulations will phase out the use of PERC dry cleaning machines by 2023, or sooner. In the interim, emissions for remaining PERC dry cleaners and dimensions will be reviewed.
- Compiling a list of significant sources of TAC and PM2.5 in the Bay Area. The top 100 permitted stationary sources of TACs and top 100 stationary sources of PM2.5, excluding diesel generators, GDFs, and dry cleaners will be identified; emissions and stack parameters will be reviewed.
- Quantifying non-permitted significant sources in communities identified as impacted through the CARE program. The work plan calls for developing a methodology or set of criteria that can be used to identify non-permitted sources with significant emission levels, focus on identifying facilities that generate significant emissions from on-road and off-road mobile sources (e.g., distribution centers, rail yards, bus terminals, etc.)
- Developing a methodology for evaluating multiple-year construction impacts in the Bay Area. The work plan calls for developing a methodology for analyzing and estimating emissions from multi-year (greater than two years) construction projects. The methodology will include a definition of applicable projects (e.g., project type, duration and size, and time horizon for future projects), types of equipment that should be included in the analysis, methods for assessing emissions over each phase of construction, and appropriate screening tools
- In addition to the above, the BAAQMD will make use of, as available and needed for plan, the following sources of information:
- DPM emissions estimates from the Port of Oakland health risk assessment for year 2005 (ARB 2008).
- SF Bay Area seaports emissions inventory for year 2005 (Moffat & Nichol and ENVIRON 2010). Reports for each port and associated emissions estimates will be publically released once all members of the Seaports Project Steering Committee present the results to their Boards.
- BAAQMD in-house development of activity and emissions along Bay Area railroad lines.

Table 2. Cancer and non-cancer risk factors for selected TACs.

TAC Name	Non-Cancer			Cancer	
	Acute Inhalation (µg/m3)	8-Hour Inhalation (µg/m3)	Chronic Inhalation (µg/m3)	Inhalation Unit Risk (µg/m3)-1	Inhalation Cancer Potency Factor (mg/kg-d)-1
DPM	–	–	5.00E+00	3.00E-04	1.1oE+00
PM2.5	–	–	–	–	–
Elemental metals*	*	*	*	*	*
acetaldehyde	4.70E+02	3.00E+02	1.40E+02	2.70E-06	1.00E-02
acrolein	2.50E+00	7.00E-01	3.50E-01	–	–
benzaldehyde	–		–	–	–
benzene	1.30E+03		6.00E+01	2.90E-05	1.00E-01
ethanol	–		–	–	–
ethylbenzene	–		2.00E+03	2.50E-06	8.70E-03
ethylene	–			-	-
ethylene dibromide (1,2-dibromoethane)	–		8.00E-01	7.10E-05	2.50E-01
ethylene dichloride (1,2-dichloroethane)	–		4.00E+02	2.10E-05	7.20E-02
ethylene glycol	–		4.00E+02	–	–
ethylene oxide (1,2-epoxyethane)	–		3.00E+01	8.80E-05	3.10E-01
ethylene thiourea	–		–	1.30E-05	4.50E-02
ethylene glycol butyl ether	1.40E+04		–	–	–
ethylene glycol ethyl ether	3.70E+02		7.00E+01	–	–
ethylene glycol ethyl ether acetate	1.40E+02		3.00E+02	–	–
ethylene glycol methyl ether	9.30E+01		6.00E+01	–	–
ethylene glycol methyl ether acetate			9.00E+01	–	–
formaldehyde	5.50E+01	9.00E+00	9.00E+00	6.00E-06	2.10E-02
methyl ethyl ketone (mek) (2-butanone)	1.30E+04		–	–	–
methylcyclopentane			–	–	–
m-xylene	2.20E+04		7.00E+02	–	–
n-hexane	–		7.00E+03	–	–
o-xylene	2.20E+04		7.00E+02	–	–
propylene	–		3.00E+03	–	–
propylene glycol monomethyl ether	–		7.00E+03	–	–
propylene oxide	3.10E+03		3.00E+01	3.70E-06	1.30E-02
toluene	3.70E+04		–	–	–

*Risk factors for selected elemental metals to be added.

Source: Office of Environmental Health Hazard Assessment 2003, 2008, 2009.

6. Dispersion/Risk Modeling

a. Modeling Approach

The BAAQMD recommends a modeling approach that provides pre-screening and evaluation for potential development areas. For example, this method could provide prescreening for the PDAs in the planning area. Where the local government's thresholds are not met, mitigations should be identified to meet the thresholds at a future target year. The proposed modeling approach would

- Identify all sensitive receptor areas in the planning area or a representative subset of receptor areas in the planning area;
- For each sensitive receptor area, identify all sources within the associated area of influence. The sensitive receptor areas include existing and planned sensitive receptors;
- Apply modeling using the base year emissions inventory to estimate the base year risks and hazards to from the sources in the area of influence to the receptors in each sensitive receptor area;
- Compare the base year risks and hazards for each sensitive receptor area to the local government's risk and hazards thresholds.
- Where the base year risks and hazards exceed the thresholds for the base year, apply modeling using the target year emissions inventory to estimate risks in the target year.
- If target year risks and hazard exceed the thresholds, identify mitigations.

b. Modeling Methodology for Estimating Local Risks and Hazards

The BAAQMD has provided guidance on acceptable methods and modeling techniques for emissions estimated and risk modeling in *Recommended Methods for Screening and Modeling Local Risks and Hazards* (BAAQMD 2010b). An additional source of information is the CAPCOA guidance document titled *Health Risk Assessment for Proposed Land Use Projects* (CAPCOA 2009).

7. Developing a Goal and/or Reduction Target

Setting goals for reducing emissions and exposures is a critical element of a plan. Local governments should consider single source and cumulative thresholds to define the plan's reduction target.

Local governments will discretion in setting the plan's target year and thus the timeframe by which progress should be made. The date for achieving the reduction target or plan goal should be tied to the community's purposes in completing the plan. Given that it may require a

number of years for the exposure levels in many communities to reach an acceptable level, setting realistic, near-term targets ensures immediate progress in bettering public health in the Plan Area.

8. Strategies to Reduce Exposures to Air Toxics and Fine Particulate Matter

a. Exposure Reduction Measures

Plans should include measures to reduce emissions from existing and new sources and reduce exposure of existing and future receptors. It is anticipated that each jurisdiction will develop a unique list of measures that best addresses the TAC and PM2.5 concerns in the area that are consistent or complimentary to other local efforts to curtail airborne health risk.

A sample list of measures that a community could select from is included in Table 3. Table 3 is not intended to be comprehensive, but should be considered representative of the types of measures the BAAQMD deems appropriate and as a starting point in reduction measure development. The BAAQMD is available to assist a local government in selecting or developing reduction measures. Measures that reduce risk and/or emissions can target either sources (new or existing) or receptors (new and existing). Additionally, sources can be either stationary or mobile. Within these two main source categories, Table 3 identifies measures as either a strengthening of an existing regulation or practice or the introduction or requirement of a new practice. For each PM2.5/TAC reduction measure, Table 3 also lists the jurisdiction that would likely be responsible for designing and implementing the measure. In some cases, the measure may be beyond the jurisdiction of either local government or the BAAQMD, for example on- and off-road mobile sources. In such cases, the measures call for incentivized reductions, voluntary reductions, or reductions achieved through negotiations with businesses and State or federal regulators.

Table 3. Potential PM2.5/TAC Reduction Measures

Sector	Description	Responsible Jurisdiction
LAND USE/LOCATION	Increase density including supporting high-density residential	Local Government
	Increase transit accessibility	Local Government
	Support office/mixed use density near transit	Local Government
	Integrate affordable and below market rate housing	Local Government
	Orient project away from auto- corridor	Local Government
	Orient project toward transit, bikeway or pedestrian corridor	Local Government
	Locate project near bike path/bike lane	Local Government

Sector	Description	Responsible Jurisdiction
	Enhance pedestrian network	**Local Government**
	Minimize barriers to pedestrian	**Local Government**
DISTANCE SETBACKS	**Establish minimum setbacks for new housing and other sensitive land uses from freeways and arterial corridors**	**Local Government**
	Avoid siting new sensitive land uses near a distribution center, other large indirect sources	**Local Government**
	Establish minimum setbacks from identified stationary sources	**Local Government**
PHYSICAL BUFFERS	**Install tiered vegetative and tree planting near source**	**Local Government**
	Set physical buffers around receptors, i.e., parking lots, vegetation, sound walls	**Local Government**
BUILDING CODE AND DESIGN	**Install and maintain air filtration systems such as passive electrostatic filtering systems with low air velocities in new development near sources.**	**Local Government**
	Install and maintain indoor air quality monitoring units in building.	**Local Government**
	Locate HVAC intakes away from emission sources	**Local Government**
	Prohibit fireplaces	**Local Government**
	Prohibit use of gasoline-powered leaf blowers and lawn mowers	**Local Government**
	Implement clean street sweepers for PM	**Local Government**
ALTERNATIVE FUEL & TRUCK RETROFIT	**Identify areas with significant truck emissions near receptors and explore options for incentives and measures through the Air District and operators to accelerate reductions in advance of regulations, such as:** - **Install diesel particulate filters on diesel engines** - **Install diesel oxidation catalysts on diesel engines** - **Accelerate replacement of older trucks** - **Replace/retrofit old buses** - **Install auxiliary power units** - **Negotiate with fleet operators to use cleaner vehicles in expanding fleet** - **Consider alternative fuels, such as compressed natural gas, hybrid, etc.** - **Install electrical hookups at truck loading docks**	**Local Government, BAAQMD**
	Coordinate with BAAQMD to target grant opportunities to identified truck sources	**Local Government, BAAQMD**

Sector	Description	Responsible Jurisdiction
GOODS MOVEMENT/PORTS	Identify areas with significant emissions from goods movement near receptors and explore options for incentives and measures with the Air District to reduce emissions, such as: - Accelerate and/or exceed measures in the Statewide Goods Movement Emission Reduction Plan (Port of Oakland) - Install electrical hookups at loading docks - Consider alternative modes of goods movement, such as cleaner rail vs. highway	Local Government, Ports, BAAQMD
	Avoid siting new sensitive land uses immediately downwind of ports in the most heavily impacted zones and establish setbacks for new development near ports	Local Government
TRUCK OPERATIONS	Implement off-hour delivery program	Local Government
	Implement truck parking restrictions	Local Government
	Identify and enforce no-idle zones	Local Government
	Enforce state laws for idling with trucks and auxiliary units	Local Government
	Restrict and/or reroute truck traffic	Local Government
	Configure on-site construction parking to minimize traffic interference and ensure emergency vehicle access	Local Government
	Design project to reduce the number of diesel vehicles congregating at any one location	Local Government
NEIGHBORHOOD/SITE ENHANCEMENTS	Support street grid designs	Local Government
	Enhance the pedestrian network	Local Government
	Implement a neighborhood electric vehicles (NEV) network including infrastructure for parking, accessibility, and charging stations	Local Government
	Support car share programs in existing parking lots and for new developments	Local Government
	Participate and encourage Safe Routes to School programs	Local Government
TRAFFIC FLOW	Implement traffic calming to reduce speeds such as, roundabouts, speed bumps, stop signs, etc.	Local Government
	Provide traffic flow improvements for areas impacted by the project	Local Government
	Route existing or projected traffic away from receptor areas	Local Government
	Improve road infrastructure system management - signal synchronizations - improve traffic flows - speed limits reflecting roadway capacities	Local Government
BICYCLE NETWORK	Provide bike lanes	Local Government

Sector	Description	Responsible Jurisdiction
	Provide bike parking	Local Government
	Require that new development provide end of trip facilities such as showers, lockers, bike racks when appropriate	Local Government
PARKING POLICY/PRICING	Implement parking pricing for on-street parking	Local Government
	Implement parking pricing for off-street parking	Local Government
	Unbundle parking from property costs	Local Government
	Require parking cash out options	Local Government
	Eliminate minimum parking requirements	Local Government
	Allow for parking reduction beyond code	Local Government
	Design pedestrian pathways through parking	Local Government
	Implement preferential parking permit program for carpoolers, etc.	Local Government
TRANSIT SYSTEM IMPROVEMENTS	Expand transit network	Local Government, Transit Districts
	Provide bus shelters for new and planned transit service	Local Government, Transit Districts
	Enhance transit service frequency and speed	Local Government, Transit Districts
	Implement Bus Rapid Transit	Local Government, Transit Districts
	Implement subsidized or discounted transit program	Local Government, Transit Districts
	Improve alternative fuel transportation options such as biodiesel, light rail, etc.	Local Government, Transit Districts
COMMUTE TRIP REDUCTION PROGRAMS	Encourage developments/employers to implement commute trip reduction program including: - Provide employees parking "cash out" options - Provide workplace parking pricing - Support alternative work schedules and telecommuting - Conduct marketing and outreach for commute trip reduction - Provide employer-sponsored vanpool/shuttle - Provide ride-sharing programs	Local Government
	Adopt transit fare subsidy policy (such as San Francisco's transit subsidy ordinance)	Local Government
	Provide shuttle system from transit stations to business centers	Local Government
MITIGATION FEE PROGRAM	Implement a mitigation fee program to fund: - Accelerating retirement of older vehicles	Local Government

Sector	Description	Responsible Jurisdiction
	and purchasing cleaner vehicles - Purchasing low-emission buses/vehicles/heavy duty trucks/light duty trucks - Retrofit heavy duty vehicles/engines	
MARINE SOURCES	For areas identified to have significant impacts from marine sources, explore options for incentives and/or additional emissions reduction measures or operational changes to reduce exposures	BAAQMD, Industry, EPA, ARB
LOCOMOTIVES	For areas identified to have significant impacts from rail emissions, explore options for incentives and/or additional emissions reduction measures or operational changes to reduce exposures	BAAQMD, Industry, EPA, ARB
	Avoid siting new sensitive land uses near a major service or maintenance rail yard	Local Government
	Support and advocate for electrifying commuter rail lines	Local Government, BAAQMD
CONSTRUCTION EXHAUST REDUCTION	Adopt a Green Construction Ordinance such as San Francisco's ordinance which requires off-road construction equipment to meet US EPA Tier 2 standards or BACT	Local Government
	Adopt conditions of approval for construction projects near receptors and/or with significant emissions to implement reduction strategies such as: - Installing PM filters on generators - Contractors to use equipment that meets CARB's most recent certification for off-road diesel engines or BACT - Electrify construction equipment - Provide grid or renewable electricity in place of generators - Phase construction activities - Minimize idling limits to two minutes and provide clear signage explaining so limits - Demonstrate fleet average of 45% reduction in PM compared to ARB's fleet average - Utilize alternative fuels and engine technologies that reduce emissions - Ensure that construction equipment is maintained and tuned	Local Government
	Reroute construction site traffic to avoid sensitive receptors	Local Government
	Provide an offsite mitigation program	Local Government
	Set setbacks/buffers between the project fence line and the population center	Local Government

Sector	Description	Responsible Jurisdiction
FUGITIVE DUST EMISSIONS	**Adopt conditions of approval for construction projects near receptors and/or with significant emissions to implement fugitive dust emission reductions such as those listed below**	**Local Government**
	Install sandbags or other erosion control measures to prevent silt from entering roadways	**Operators**
	Maintain on-site truck loading zones	**Operators**
	Install wind breaks	**Operators**
	Street and shoulder paving and runoff and erosion control in project areas	**Operators**
	Apply water every 4 hours to the area within 100 ft of a structure being demolished, to reduce vehicle trackout.	**Operators**
	Apply layer of wood chips, mulch, or gravel to site accesses 100 ft from paved road	**Operators**
	Install a gravel apron, 25 ft long by road width, to reduce mud/dirt trackout from unpaved truck exit routes.	**Operators**
	Apply dust suppressants (e.g., polymer emulsion) to disturbed areas upon completion of demolition.	**Operators**
	Apply water to disturbed soils after demolition is completed or at the end of each day of cleanup.	**Operators**
	Prohibit demolition activities when wind speeds exceed 25 mph.	**Operators**
	Apply water every 3 hours to disturbed areas within a construction site.	**Operators**
	Require minimum soil moisture of 12% for earthmoving by use of a moveable sprinkler system or a water truck. Moisture content can be verified by lab sample or moisture probe.	**Operators**
	Limit on-site vehicle speeds (on unpaved roads) to 15 mph by radar enforcement.	**Operators**
	Replace ground cover in disturbed areas as quickly as possible.	**Operators**
	All trucks hauling dirt, sand, soil, or other loose materials are to be tarped with a fabric cover and maintain a freeboard height of 12 inches.	**Operators**
	Implement street sweeping program with Rule 1186 compliant PM10 efficient vacuum units (14-day frequency)	**Operators**
	Install pipe-grid trackout-control device to reduce mud/dirt trackout from unpaved truck exit routes.	**Operators**

Sector	Description	Responsible Jurisdiction
	Require paved interior roads to be 100 ft long, 12 ft wide per lane and edged by rock berm or row of stakes, or add 4 foot shoulder for paved roads.	**Operators**
	Limit maximum speed on unpaved roads to 25 miles per hour.	**Operators**
	Pave unpaved roads and unpaved parking areas.	**Operators**
	Implement watering twice a day for industrial unpaved road.	**Operators**
	Provide construction of 3-sided enclosures with 50% porosity around storage pile	**Operators**
	Water the storage pile or apply cover when wind events are declared.	**Operators**
	Plant tree windbreaks on the windward perimeter of construction projects if adjacent to open land.	**Operators**
	Plant vegetative ground cover in disturbed areas as soon as possible.	**Operators**
	Provide continuous water spray at conveyor transfer point	**Operators**
STATIONARY SOURCES		
SETBACKS/BUFFERS	**Avoid siting new land uses immediately downwind of petroleum refineries.**	**Local Government**
	Avoid siting new sensitive land uses near a chrome plater	**Local Government**
	Minimum setbacks of new housing from petroleum refineries, gas stations, and other stationary sources	**Local Government**
	Separate stationary sources from receptor areas	**Local Government**
REGULATIONS	**For areas identified to have significant impacts from stationary sources, explore specific options for new or amended regulations for implicated source categories**	**BAAQMD**

In selecting or developing measures for a plan, the local government should determine if the measures are sufficient to meet the reduction target. Both qualitative and quantitative reduction measures should be considered when evaluating an individual projects consistency with a plan.

b. Responsibility for Implementation

Much like measures aimed at reducing greenhouse gases within a climate action plan, the responsibility of implementing measures to reduce emissions of and risk related to TACs and PM2.5 falls on several parties. First, the state, primarily through the ARB, has the authority to

regulate vehicles and equipment statewide. Measures, or suites of measures such as the Diesel Risk Reduction Plan, while implemented statewide, result in significant local reductions. Second, the local government has authority over zoning, permitting, standards for new development, and the institution of local-level programs to reduce emissions or risk. Third, the proponent of a project within the Area of Influence can incorporate design features into a project that reduce emissions from a new source, or include as mitigation actions that address an existing source within the Area of Influence, or select a site for a project that minimizes risk to existing receptors in the Plan Area.

9. Monitoring and Updating

a. Monitoring and Updates

A plan based approach to reducing risk and hazards defines a path to overall reduced health risk exposure in the plan area by a target date. Because the task of risk reduction is challenging for many communities, the target date may be far into the future. The BAAQMD's primary goal is to reduce health risk to residents in the region. A plan should periodically demonstrate that it is achieving real health results equivalent to those achieved through individual project analysis. The ability of a community to reduce risk is inextricably related to efforts at the state level. A plan should reflect the most current projections of the effectiveness of these regulations.

b. Updating Frequency

A plan should be updated whenever the BAAQMD updates its district-wide TAC and PM2.5 emissions inventory and/or whenever a significant change in the underlying assumptions or baseline conditions of a plan have changed. For example, if some fraction of the plan area is rezoned, a plan update would be appropriate. Because a plan relies on district-wide TAC and PM2.5 inventory data compiled by the BAAQMD, a plan can be updated at a maximum frequency in sync with BAAQMD inventory updates. However, if a community has the resources to update more frequently, it is certainly encouraged to do so. The BAAQMD anticipates updates to the district inventory at 5-year intervals. A plan can also be updated when new reduction measures arise that may be more effective than those in the existing plan.

c. Revising Plan Reduction Targets

Communities may want to pursue additional analysis or revise a plan if the underlying assumptions and analysis of the original plan are no longer valid or applicable. Because significant reductions in DPM exposure are expected in the coming years due to state regulations, a community's ability to reach a target will be inextricably tied to the success of these programs. These issues will be taken into account through milestone years and updates as discussed above.

d. Recommendations for a Plan Update

At a minimum, a plan update should incorporate the BAAQMD's latest inventory data for TAC and PM2.5 sources, model runs using this data, and the latest projections of effects of state and local measures. Any update should meet the specific targets included in a plan. This means that additional or different measures may need to be added if and when new sources or receptors are contemplated than were included in the last version of a plan. The BAAQMD expects that the update process will be less labor intensive than plan development and that a large portion of the analysis performed at plan development, can be leveraged for the update.

e. Gauging a Community's Progress

A community's progress can be gauged, in part, by comparing emissions within the area of influence for a sensitive receptor area in the base year and to the emissions in the target year once adjusted for all measures implemented. Comparison to the baseline emissions will identify whether emissions are being reduced over time.

Dispersion modeling with base and target year emissions will also reveal whether progress is being made. Modeled risk and PM2.5 for sensitive receptor areas can be periodically compared to the local government's air quality thresholds

Local-scale measurements are another way to gauge progress. However, it is expensive to conduct local-scale monitoring with enough spatial coverage and over a long enough time span to establish trends. The BAAQMD has committed to making measurements in several CARE communities with its mobile sampling van during 2010, but cannot yet commit to follow-up sampling at later times.

10. CEQA and a Plan Based Approach to Reducing Risk and Hazards

a. Analysis Recommendations for Projects Consistent with a Plan

Using a local government's determined CEQA air quality thresholds as the reduction target for plans greatly simplifies the requirements for showing consistency of a new development project with the plan area. For development projects that bring new receptors to a city or county—for example a new residential housing development—if the project is within a sensitive receptor area that meets the CEQA thresholds by the target date, that project would not result in a significant impact to the environment, as defined under CEQA, from TAC or local sources of fine particulate matter. In essence, the plan would provide pre-screening and up-front mitigations for future projects, while at the same time identifying risk and hazard zones and their sources.

For development projects that introduce new sources into a community, those sources should be accounted for in the plan to qualify for streamlining. Sources not considered in the plan would require separate environmental analysis and would not qualify for streamlining. In

general, stationary sources will remain subject to all BAAQMD permit requirements regardless of whether a plan is prepared or not.

It is possible that, in some areas, a plan, including all mitigation measures, may not be able to reduce local risks and hazards to the plan's reduction targets. This may occur for existing or planned sensitive receptor areas.

b. CEQA Compliance for a Plan

The BAAQMD recommends CEQA compliance for plan adoption in order to allow for future streamlining of analysis of TAC/PM2.5 health risks for project fully consistent with a plan. A plan will include the discretionary adoption by the local municipality of certain standards and measures that could have secondary impacts on the environment. Thus a plan is a project under CEQA. However, it may be possible that a plan could be adopted using a Categorical Exemption or an IS/MND depending on the measures included in a plan and the secondary effects identified by the lead agency in its evaluation.

Resources

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